

The Applicants respectfully reassert that numerous instances of support for the use of non-chelating ligands in the claimed methods may be found in the Exemplification section of the instant application. For example, Examples 62, 63, 65, 66, 67 and 69 disclose specific embodiments of the claimed methods in which the catalyst is palladium(II) acetate [ $\text{Pd}(\text{OAc})_2$ ]; pertinently, this catalyst consists of a palladium(II) ion and two acetate anions, which anions the Applicants understand to function as non-chelating ligands. Further, endnote 11 in Example 1 (page 52) indicates that tri-*o*-tolylphosphine, a non-chelating ligand, was examined in the palladium-catalyzed coupling of cyclohexanone with 1-bromo-4-*t*-butylbenzene.

Additionally, the Examiner asserts that there is ambiguity as to which ligands are chelating, citing page 34, line 19 in support of the assertion. The Applicants respectfully point out that the discussion from which the Examiner has drawn the excerpt is concerned with speculation about ligand characteristics that may accelerate the reductive elimination step of the generally-accepted mechanism for transition-metal-catalyzed sigma bond formation. In other words, the excerpt does not state that chelating ligands are required or even preferred in the methods of the present invention. In its entirety, the sentence from which the excerpt was taken states "In particular, the use of bulky and less electron-donating ligands (but probably still chelating ligands) should favor the reductive elimination process." Importantly, the Applicants respectfully assert that an objective reading of the entire sentence makes clear that it does not indicate that the use of chelating ligands is required in the claimed methods or that the use of non-chelating ligands would be undesirable. Rather, the sentence addresses the potential effects of the relative steric bulk and electron density of ligands on one step in the presumed reaction mechanism underlying the claimed methods.

Finally, the Examiner contends that on pages 34-37 of the Specification, the Applicants "constantly refer" to the use of chelating ligands. The Applicants respectfully contend that a careful reading of the cited pages does not support this assertion. For example, on page 34, a number of palladium catalysts without chelating ligands are explicitly mentioned, including  $\text{PdCl}_2$ ,  $\text{Pd}(\text{OAc})_2$ ,  $(\text{CH}_3\text{CN})_2\text{PdCl}_2$ ,  $\text{Pd}(\text{P}(\text{C}_6\text{H}_5)_3)_4$ , and polymer supported  $\text{Pd}(0)$ . Also on page 34, nickel catalysts without chelating ligands are explicitly mentioned, including Raney nickel and  $(\text{P}(\text{C}_6\text{H}_5)_3)_2\text{NiCl}_2$ .

Moreover, on page 35, the Specification states that "In certain embodiments of the subject method, the transition metal catalyst includes one or more phosphine ligands.... The phosphines can be monodentate phosphine ligands, such as trimethylphosphine, triethylphosphine, tripropylphosphine, triisopropylphosphine, tributylphosphine, tricyclohexylphosphine, trimethyl phosphite, triethyl phosphite, tripropyl phosphite, triisopropyl phosphite, tributyl phosphite and tricyclohexyl phosphite, in particular triphenylphosphine, tri(o-tolyl)phosphine, triisopropylphosphine or tricyclohexylphosphine...." Therefore, the Applicants respectfully contend that ample reference is made in the Specification to the use of non-chelating, i.e., monodentate, ligands. Consequently, the Applicants respectfully assert that the Specification may not be relied upon to support the notion that the Applicants disfavored, let alone taught away from, the use of catalysts comprising at least one non-chelating ligand.

Accordingly, withdrawal of the rejections under 35 U.S.C. § 112 ¶1 is respectfully requested.

**Claim Rejections Based on 35 USC § 102(e) or § 103(a)**

Claims 1-35 stand rejected under 35 U.S.C. § 102(e) or 103(a), based on the Examiner's contention that they are anticipated by, or obvious in light of, Hartwig et al., United States Patent 6,057,456 ("the '456 patent"). The Applicants respectfully disagree.

As outlined in their previous Response, pending claim 1 limits the definition of the transition metal catalyst to a catalyst that "consists essentially of a Group VIIIA metal; and at least one non-chelating ligand." Therefore, the Applicants respectfully contend that the pending claims are not anticipated by or obvious in light of the '456 patent because the teachings of the '456 patent are limited to methods using "at least one chelating ligand selected from the group consisting of unsaturated Group 15 heterocycles, Group 15-substituted metallocenes, Group 15-substituted alkanes, and Group 15-substituted arlenes." In other words, the Applicants respectfully assert that the '456 patent's teachings as to methods using only "chelating ligands" do not anticipate or render obvious methods which are limited to catalysts consisting essentially of "a Group VIIIA metal; and at least one non-chelating ligand."

Accordingly, withdrawal of the rejections under 35 U.S.C. § 102(e) or 103(a) is respectfully requested.

Conclusion

In view of the above amendments and remarks, it is believed that the pending claims are in condition for allowance. If a telephone conversation with Applicants' Attorney would expedite prosecution of the above-identified application, the Examiner is urged to contact the undersigned at (617) 832-1000.

Respectfully submitted,

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